SECTION 831
TRAFFIC SIGNAL HEADS

831.01. DESCRIPTION.

This item shall consist of providing and installing traffic signal heads and lamps on various types of supports at locations shown on the Plans and in conformance with these Specifications and the Institute of Traffic Engineers Standard Specifications.

831.02. MATERIALS.

The traffic signal head or pedestrian head and all component parts can be either polycarbonate or die cast aluminum and shall conform to the ITE Standard for Adjustable Face Vehicular Traffic Control Signal Heads. All pedestrian signal heads shall meet the requirements of the ITE Standard Adjustable Face Pedestrian Signal Head Standard.

Traffic signal lamps furnished shall conform to the ITE Standard for Traffic Signal Lamp.

A minimum of 60 watt, 590 lumens, 120 volt, clear, traffic signal lamps of 8000 hour minimum rated life shall be furnished with 8 inch (200 mm) signal heads and 12 inch (300 mm) pedestrian heads. A 150 watt, 1750 lumens, 120 volt, clear, traffic signal lamp of 6000 hour minimum rated life shall be furnished with 12 inch (300 mm) traffic signal heads. All reflectors shall be specular alzak aluminum.

If light emitting diode (LED) lamps are specified in the plans to be used in lieu of traffic signal lamps, the LED modules shall meet the requirements in the Institute of Traffic Engineering Standard titled "Vehicle Traffic Control Signal Heads" (VTCSH). The colors of the LED traffic signal modules shall conform to the chromaticity requirements of Section 8.04 and Figure 1 of the VTCSH standard. The LED modules should be of screw-in type as direct replacements for traffic signal lamps.

All die cast aluminum surfaces of the door, visors, and signal housing inside and outside shall be painted before assembly with three coats as follows:

First coat - Primer: Oxide Baking Primer, which meets or exceeds the performance specifications of Federal Specifications TT-P-636.

Second coat - Grey Enamel:Medium Grey Alkyd Urea Exterior Baking Enamel which complies with Federal Specifications TT-E-489.

Third coat - Yellow Enamel: Highway Yellow, best quality, synthetic resin enamel. The third coat on the inside and outside of the visors and the face of the signal doors shall be an Alkyd Urea Exterior Synthetic Baking Enamel, with minimum gloss reflectance meeting the performance requirements of TT-E-489, Enamel Heat Resisting Glyceryl Phthalate, Type 4, Instrument Black.

831.04. CONSTRUCTION METHODS.

Make each signal head weathertight.

NOTE: A signal head may consist of one or more signal sections of the adjustable, incandescent type, with multiple signal sections rigidly and securely fastened together. Each signal section shall be a self-contained assembly consisting of an optical unit with housing, housing door, visor, and glass lenses unless otherwise specified on the plans. Supply signal heads with all brackets and fittings necessary for proper mounting on the type of signal support designated on the Plans, and

make them capable of being positively positioned to control the movement of one direction of traffic.

831.05. METHOD OF MEASUREMENT.

The *traffic signal heads* and lamps will be measured by the unit, complete in place, including wiring and all hardware.

831.06. BASIS OF PAYMENT.

The accepted traffic signal heads and lamps, measured as provided above, will be paid for at the contract unit price as follows:

TRAFFIC SIGNAL HEADS ..... EACH

Such payment shall be full compensation for furnishing materials, labor, equipment, and incidentals necessary to complete the work as specified.

SECTION 832
OPTICALLY PROGRAMMED ADJUSTABLE TRAFFIC SIGNAL HEADS

832.01. DESCRIPTION.

This work shall consist of providing and installing optically programmed adjustable traffic signal heads and lamps on various types of supports at locations shown on the Plans in conformance with these Specifications.

832.02. MATERIALS.

The optically programmed adjustable traffic signal head shall permit the visibility zone of the indication to be determined optically and require no hoods or louvers. The projected indication(s) may be selectively visible or veiled anywhere within 15° of the optical axis and shall emanate from a single section. No indication shall result from external illumination nor shall one light unit illuminate a second unit.

(a) **Optical System.**

1. The lamp shall be nominal 75 watt, 120 volt AC, three prong, sealed beam having an integral reflector with stippled cover and an average rated life of at least 6,000 hours.
2. The lamp collar including specular inner surface shall couple the lamp to the diffusing element.
3. The diffusing element may be discrete or integral with the convex surface of the optical limiter. The optical limiter shall provide an accessible imaging surface at focus on the optical axis for objects 900 to 1200 feet (275 to 365 m) distance, and permit an effective veiling mask to be variously applied as determined by the desired visibility zone. The optical limiter shall be composed of heat resistant glass.
4. The objective lens shall be a high resolution planar incremental lens, hermetically sealed within a flat laminant of weather resistant acrylic or approved equal. The lens shall be